IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of:

Applicants : Robert A. Hendel and Jean M. Lovett
Serial No. : 10/663,585
Filed : September 16, 2003
Title : TREATMENT OF SEMI-PERMEABLE FILTRATION MEMBRANES
Docket : 020354 071P2
Examiner : Joseph W. Drodge
Art Unit : 1723
Customer No. : 33,805

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir/Madam:

Declaration of Adnan Mansour

-- 37 CFR 1.132 –

[001] I, Adnan Mansour, declare that I received a B.S. Degree with honors in Chemistry from Queen's University in Kingston, Ontario, Canada and a Ph.D. in Chemistry from the University of Michigan.

[002] I am employed by the assignee of the above identified application where I am the Global Technology Leader for Water, Waste, and Membrane Chemicals.

[003] The claims, as amended herein, indicate that the polymers, when used in a semi-permeable membrane separatory system to desalinate water, are capable of inhibiting calcium phosphate precipitation while improving salt rejection and not adversely affecting throughput of the aqueous solution or dispersion through the membrane.

[004] Salt rejection efficacy is, of course, of paramount concern in any desalination system. Indeed, even improvements on the order of a tenth of a percent are important when one considers that typical initial salt levels encountered may be on the order of 25,000 ppm salt and that in most cases, it is desired to reduce that salt level to about 50 ppm or less to produce potable water.

[005] Attached to this affidavit are two graphs, marked as Exhibits A and B respectively, highlighting salt rejection and membrane throughput characteristics of several prior art treatments shown in contrast to the AA/APES copolymer treatment as set forth in the present claims. The test conditions used to generate the data were basically the same as those described on pages 7 and 8 of the application.

[006] The legend for the treatment additives in Exhibits A and B is as follows:

AA/APES - present invention;

acrylic acid / allyloxypolyethoxy (10) sulfate

H-MDC–150 = diethylenetriamine

pentamethylene phosphonic acid -- comparative phosphonate treatment (See McNeel et al., U.S. Patent 6,180,056 column 4, line 17 and the examples).

DCA-222 = AA/AHPES

acrylic acid / allylhydroxylpropylsulfonate ether – comparative copolymer (See description paragraph **[0045]** of specification).

[007] Turning first to consideration of the data shown in Exhibit A, it can be seen that the flow rate or flux for the H-MDC-150 (McNeel et al.), AA/APES, and DCA-222 treatment additives is somewhat comparable, with all of these showing improvement over no treatment.

[008] Exhibit B however shows that in terms of salt retention, the AA/APES treatment of the invention shows marked improvement with this polymer demonstrating a definite upward trend as more time elapses. In this context, desalination processes are often run for days and months on end without interruption.

[009] In light of the above, the increased salt retention attributes of this invention are quite surprising, especially compared to the performance of the DCA-222 treatment which has been used in reverse osmosis systems for some time, and the H-MDC-150 phosphonate antiscalant taught by McNeel et al.

[010] I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signature: _____ Date: 11 Jan 07

Adnan Mansour